ABSTRACT OF THE DISCLOSURE

In an arrayed waveguide grating, a wedge-shaped groove formed in an arrayed waveguide section or a silica-based waveguide section in a periphery of the groove is modified in either one of the procedures below or in a particular combination thereof to suppress spreading of light in the groove to thereby reduce the excess loss due to addition of the groove. The material filled in the groove is a photosensitive material having a negative refractive index temperature coefficient. Using the photosensitivity, refractive index difference is provided in the groove to form optical waveguides in a horizontal direction or in vertical and horizontal directions. The material filled in the groove has a negative refractive index temperature coefficient to minimize a spreading angle of light incident to the groove. Width of each silica-based waveguide is enlarged before and after the groove to decrease the spreading angle of light incident to the groove. This method reduces the excess loss of the arrayed waveguide grating in which a wavelength characteristic is kept unchanged with respect to a change in ambient temperature.